

TO-252  
(DPAK)



Pin Definition:

1. Input
2. Ground (tab)
3. Output

### General Description

The TS78M05A Series positive voltage regulators are identical to the popular TS7805 Series devices, except that they are specified for only half the output current. Like the TS7805 devices, the TS78M05A Series 3-Terminal regulators are intended for local, on-card voltage regulation.

Internal current limiting, thermal shutdown circuitry and safe-area compensation for the internal pass transistor combine to make these devices remarkably rugged under most operating conditions. Maximum output current with adequate heatsink is 500mA

### Features

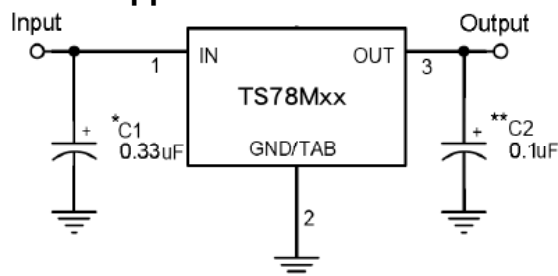
- Output Voltage 5V
- Output current up to 500mA
- Internal thermal overload protection
- Internal short-circuit current limiting
- Output transistor safe-area compensation
- Output voltage offered in 2% tolerance

### Ordering Information

Part No.	Package	Packing
TS78M05ACP RO	TO-252	2.5Kpcs / 13" Reel
TS78M05ACP ROG	TO-252	2.5Kpcs / 13" Reel

**Note:** "G" denotes Halogen Free Product.

### Standard Application Circuit



A common ground is required between the input and the output voltages. The input voltage must remain typically 2.0V above the output voltage even during the low point on the Input ripple voltage.

XX = these two digits of the type number indicate voltage.

\* = C<sub>in</sub> is required if regulator is located an appreciable distance from power supply filter.

\*\* = C<sub>o</sub> is not needed for stability; however, it does improve transient response.

### Absolute Maximum Rating (T<sub>a</sub> = 25°C unless otherwise noted)

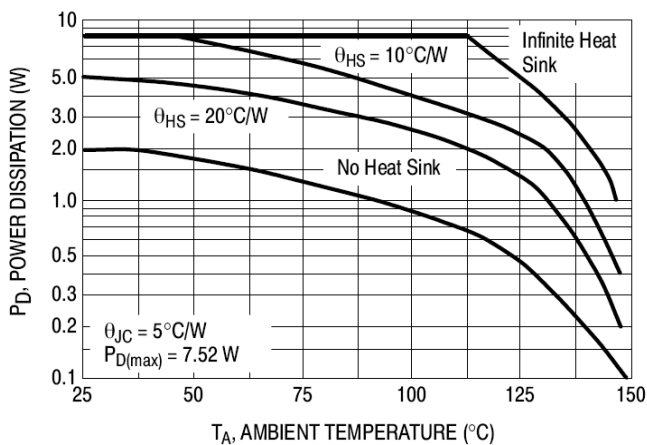
Parameter	Symbol	Limit	Unit
Input Voltage	V <sub>IN</sub> *	35	V
Power Dissipation	P <sub>D</sub>	Internal Limited	W
Operating Junction Temperature	T <sub>J</sub>	0~+125	°C
Storage Temperature Range	T <sub>STG</sub>	-65~+150	°C
Thermal Resistance - Junction to Case	Rθ <sub>JC</sub>	8	°C/W
Thermal Resistance - Junction to Ambient	Rθ <sub>JA</sub>	100	°C/W

### TS78M05A Electrical Characteristics

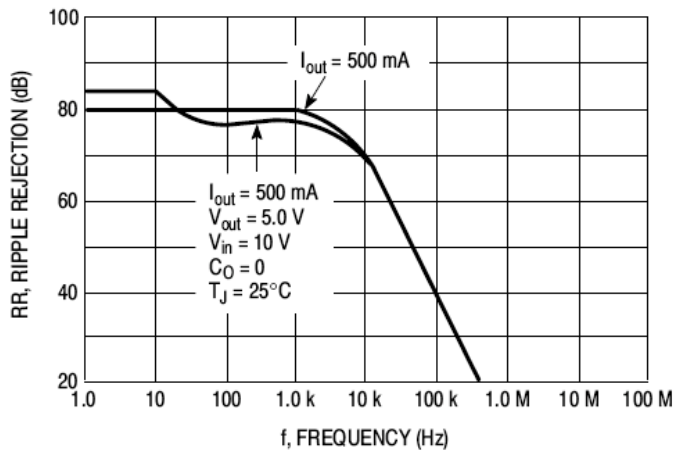
( $V_{in}=10V$ ,  $I_{out}=350mA$ ,  $0^{\circ}C \leq T_j \leq 125^{\circ}C$ ,  $C_{in}=0.33\mu F$ ,  $C_{out}=0.1\mu F$ ; unless otherwise specified.)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Output voltage	Vout	$T_j=25^{\circ}C$	4.90	5	5.10	V	
		$7.5V \leq V_{in} \leq 20V$ , $5mA \leq I_{out} \leq 350mA$	4.80	5	5.20		
Line Regulation	REGline	$T_j=25^{\circ}C$	$7.5V \leq V_{in} \leq 25V$	--	3	100	mV
			$8V \leq V_{in} \leq 12V$	--	1	50	
Load Regulation	REGload	$T_j=25^{\circ}C$	$5mA \leq I_{out} \leq 500mA$	--	15	100	mV
			$5mA \leq I_{out} \leq 200mA$	--	5	50	
Quiescent Current	Iq	$I_{out}=0$ , $T_j=25^{\circ}C$	--	3	6	mA	
Quiescent Current Change	$\Delta Iq$	$7.5V \leq V_{in} \leq 25V$	--	--	0.8		
		$5mA \leq I_{out} \leq 350mA$	--	--	0.5		
Output Noise Voltage	Vn	$10Hz \leq f \leq 100KHz$ , $T_j=25^{\circ}C$	--	40	--	$\mu V$	
Ripple Rejection Ratio	RR	$f=120Hz$ , $8V \leq V_{in} \leq 18V$	62	78	--	dB	
Voltage Drop	Vdrop	$I_{out}=500mA$ , $T_j=25^{\circ}C$	--	2	--	V	
Output Resistance	Rout	$f=1KHz$	--	17	--	$m\Omega$	
Output Short Circuit Current	Ios	$T_j=25^{\circ}C$	--	50	--	mA	
Peak Output Current	I <sub>o peak</sub>	$T_j=25^{\circ}C$	--	0.7	--	A	
Temperature Coefficient of Output Voltage	$\Delta V_{out} / \Delta T_j$	$I_{out}=5mA$ , $0^{\circ}C \leq T_j \leq 125^{\circ}C$	--	-0.2	--	$mV / ^{\circ}C$	

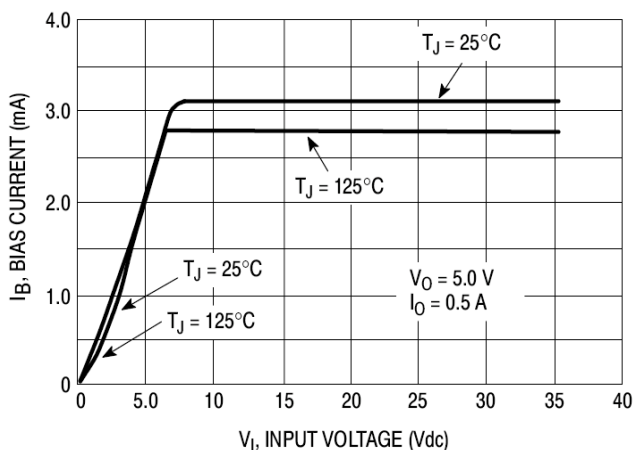
### Electrical Characteristics Curve



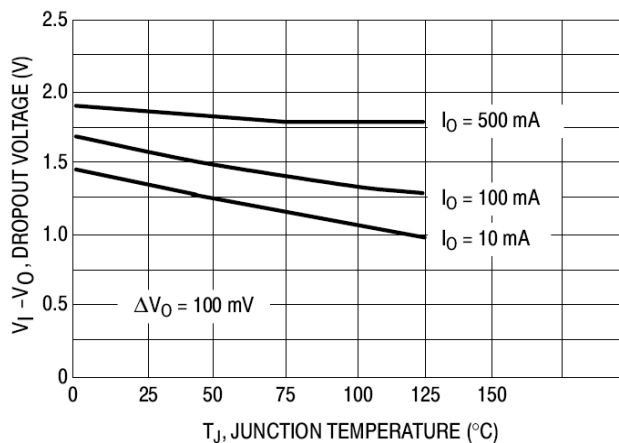
**Figure 1. Worst Case Power Dissipation vs. Ambient Temperature (TO-220)**



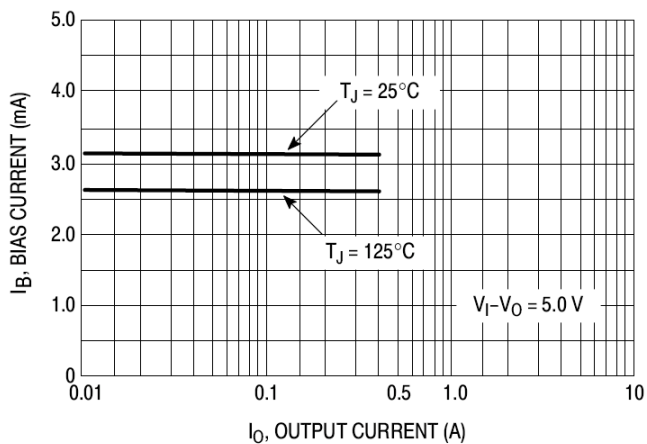
**Figure 3. Ripple Rejection vs. Frequency**



**Figure 3. Bias Current vs. Input Voltage**

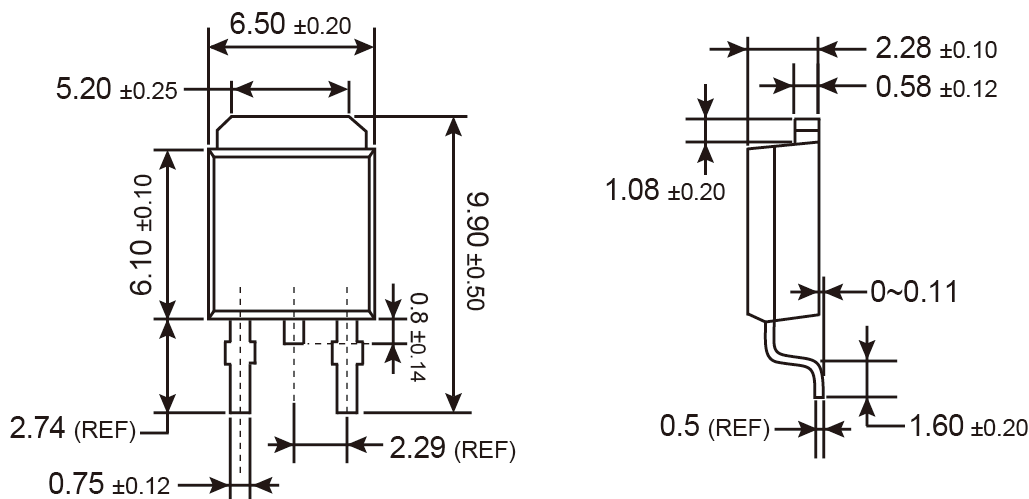


**Figure 4. Dropout Voltage vs. Junction Temperature**



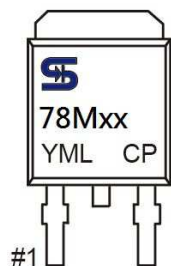
**Figure 5. Bias Current vs. Output Current**

### TO-252 Mechanical Drawing



Unit: Millimeters

### Marking Diagram



- XX** = Output Voltage  
(05=5V)
  - Y** = Year Code
  - M** = Month Code  
(A=Jan, B=Feb, C=Mar, D=Apr, E=May, F=Jun, G=Jul, H=Aug, I=Sep, J=Oct, K=Nov, L=Dec)
  - L** = Lot Code
  - CP** = Package Code for TO-252
- Month Code for Halogen Free Product  
(O=Jan, P=Feb, Q=Mar, R=Apr, S=May, T=Jun, U=Jul, V=Aug, W=Sep, X=Oct, Y=Nov, Z=Dec)

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